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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,091	06/05/2007	Uwe Schierhorn	06-479	5492
34704 7590 12/29/2010 BACHMAN & LAPOINTE, P.C. 900 CHAPEL STREET SUITE 1201 NEW HAVEN, CT 06510				
EXAMINER				
KOAGEL, JONATHAN BRYAN				
ART UNIT		PAPER NUMBER		
3744				
MAIL DATE		DELIVERY MODE		
12/20/2010		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/589,091

Applicant(s)

SCHIERHORN, UWE

Examiner

JONATHAN KOAGEL

Art Unit

3744

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 October 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-942)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 14-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitation "modified expansion valve" is unclear in context when given the definition "realization of a fluid connection" as defined in the specification on page 2 line 2. Examiner as best understood interprets this definition to be in fluid communication with a refrigerant line.

The recitation "modified linear compressor" is unclear in context with given the definition "realization of a fluid connection" as defined in the specification on page 2 lines 2-6. This limitation, as best understood, has been interpreted as being in fluid communication with a refrigerant line.

The recitation "without a significant pressure drop" (claim 14 lines 11-12) is unclear in context. It is not clear how much the pressure has to drop to be considered a "significant pressure drop", since significant is a relative term and there is no specifics disclosed as to the actual drop in pressure. This limitation as best understood, has been interpreted as a drop in pressure still occurs.

The recitation "through flow occurs without a significant pressure change is possible" (claim 19 lines 9-10) is unclear in context. It is not clear how much the pressure has to change to be considered "a significant pressure change", since

significant is a relative term and there is not specifics disclosed as to the actual change in pressure. This limitation is best understood, has been interpreted as a through flow while a change in pressure still occurs.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14, 15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno et al. US Patent No. 6,131,401 and McCarty US Patent No. 4,285,210 and Monfarad US Publication No. 2003/0043542 A1.

Regarding claim 1, Ueno teaches in fig. 1, a refrigeration installation having at least one refrigeration consumer 10, 20 which includes at least one evaporator 16, 26, having at least one feed line (See annotated figure below) and at least one discharge line (See annotated figure below), via which a refrigerant is fed to the at least one refrigeration consumer 10, 20 and discharged from the at least one refrigeration consumer 10, 20, the at least one refrigeration consumer 10, 20 having expansion members 15, 25 wherein, the expansion members 15, 25 comprise modified expansion valves, each said expansion member being connected upstream of the evaporator of each refrigeration consumer and each said refrigeration consumer 10, 20 being assigned a modified linear compressor 14, 24. Ueno fails to explicitly teach the

modified expansion valves which are moved into a working position during defrosting which allows flow to pass through the valve without a significant pressure drop and the modified linear compressor which is operated without oil.

McCarty teaches in fig. 3, a refrigeration consumer that has a modified expansion valve 27 that has a working position which is moved into during defrosting which allows flow to pass through the valve without a significant pressure drop (column 6 lines 59-61). The expansion member 27 is considered to be a modified expansion valve because it is in fluid communication with the refrigeration system. McCarty discloses that a pressure differential bleeds down in the system through the modified expansion valve, and since the compressor is not in this mode of operation, a significant pressure drop does not exist between the inlet and the outlet of the modified expansion valve as flow is passing through the valve.

It would have been obvious to a person of ordinary skill in the art at the time of invention to modify Ueno with the teachings of McCarty to include a modified expansion valve that which is moved into a working position during defrosting which allows a flow to pass through the valve without a significant pressure drop in order to allow a warmer and more uniform temperature refrigerant to be utilized for a defrosting operation. When a more uniform temperature refrigerant is discharged to the evaporator, the time necessary for defrost is decreased, lowering the operating costs of the system. Ueno as modified by McCarty fails to explicitly teach a modified linear compressor which is operated without oil.

Monfarad teaches the technique of using a linear compressor which is operated without oil (paragraph 40). The use of a linear compressor prevents any problems due to maintenance and potential leaks which come about due to the use of the oil in the compressor.

It would have been obvious to a person of ordinary skill in the art at the time of invention to modify the combined teachings of Ueno and McCarty with the teachings of Monfarad to include a linear compressor which is operated without oil that when combined by Ueno there would be a modified linear compressor which is operated without oil in order to prevent any problems in terms of system operation, maintenance, potential leaks and weight (Monfarad paragraph 40 lines 5-7). Since no oil is being used a user does not have to worry about oil leaking from the compressor as well as maintenance of the compressor due to a critical oil level.

Regarding claim 15, Ueno as modified above teaches the invention as disclosed and Ueno further teaches in fig. 1, wherein the at least one refrigeration consumer 10, 20 has a dedicated closed refrigerant cycle 12, 22, the refrigerant cycle 12, 22 being operatively connected via at least one liquefier 13, 23 to the at least one feed line and the at least one discharge line, the refrigerant cycle 12, 22 in each case having modified expansion valves 15, 25 and modified linear compressors 14, 24, and the evaporator 16, 26 of said at least one refrigeration consumer 10, 20 in each case being arranged higher than the liquefier 13, 23 of the said at least one refrigeration consumer 10, 20 (column 4 lines 1-11, column 5 line 13-column 6 line 57). From a horizontal reference

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point of view in fig. 1 where a left direction is defined as a lower point and a right direction is defined as a higher point, the evaporator is arranged higher than the liquefier.

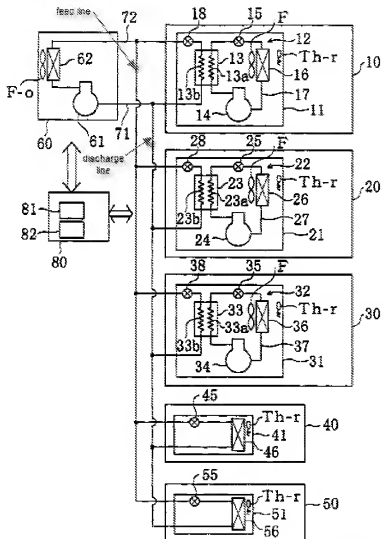


Fig. 1

Regarding claim 19, Ueno as modified above teaches the invention as disclosed and Ueno further teaches in fig. 1, a method for operating a refrigeration installation comprising assigning at least one refrigeration consumer 10, 20 modified expansion valves 15, 25 and modified linear compressors 14, 24. Ueno fails to explicitly teach during a defrosting phase of at least one of the refrigeration consumers moving at least one of the modified expansion valves and at least one of the modified linear compressors of the refrigeration consumers which are to be defrosted into a working position in which through flow occurs without a significant pressure change is possible.

However, McCarty teaches in fig. 3, a refrigeration consumer that during a defrosting phase of a refrigeration consumer 12, the refrigeration consumer moving at least one of a modified expansion valve 27 and at least one of a modified linear compressor 36 of the refrigeration consumer 12 which are to be defrosted into a working position in which through flow without a significant pressure change is possible (column 6 lines 59-61). The expansion member 27 is considered to be a modified expansion valve because it is in fluid communication with the refrigerant system. It moves into a working position during defrost (where refrigerant is bypassed around the expansion valve via valve 37 and at the same time a pressure differential bleeds through the valve 27 which indicates a flow of refrigerant) which allows the pressure of the refrigerant in the system not to have a significant pressure drop because some of the refrigerant is being bypassed around the modified expansion valve. This reduces the overall refrigerant pressure drop of the system. The compressor is considered a modified compressor because it is in fluid communication with the refrigeration system.

The modified linear compressor moves into a working position (compressor turning off) in which a through flow (through the system) without a significant pressure change is possible. When the compressor is not in operation, there is no significant pressure change within the system as the compressor is not providing a high pressure refrigerant to the system.

It would have been obvious to a person of ordinary skill in the art at the time of invention to modify Ueno, McCarty and Monfarad a defrosting phase of at least one of the refrigeration consumers moving at least one of the modified expansion valves and at least one of the modified linear compressors of the refrigeration consumers which are to be defrosted into a working position in which through flow without a significant pressure change is possible in order to allow a warmer and more uniform temperature refrigerant to be utilized for a defrosting operation. When a more uniform temperature refrigerant is discharged to the evaporator, the time for defrost is decreased, lowering the operating costs of the system, as the compressor does not have to operate as long during a defrosting period.

Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno, McCarty and Monfarad as applied to claim 14 above, and further in view of Fixemer US Patent No. 5,752,726.

Regarding claim 16, Ueno as modified above teaches the invention as disclosed and Ueno further teaches in fig. 1, wherein a plurality of refrigeration consumers 10, 20

are connected to the at least one feed line and the at least one discharge line. Ueno fails to explicitly teach the connection is by means of couplings.

However, Fixemer teaches in fig. 1 a quick-action coupling for a refrigerant line (column 1 lines 4-10) that is particularly useful to establish a fluid-tight connection.

It would have been obvious to a person of ordinary skill in the art at the time of invention to modify the combined teachings of Ueno, McCarty and Monfarad with the teachings of Fixemer to include a coupling in order to insure a proper seal between the feed/discharge lines and the refrigeration consumer, so refrigerant does not leak which would cause the compressor to become damaged from a lack of refrigerant.

Regarding claim 17, Ueno as modified above teaches the invention as disclosed and Fixemer further teaches in fig. 1, wherein said couplings are quick fit couplings (column 1 lines 4-10).

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueno, McCarty and Monfarad as applied to claim 14 above, and further in view of Sakamoto et al. JP Publication No. 2003-065616.

Regarding claim 18, Ueno as modified above teaches the invention as disclosed but fails to explicitly teach a supercooler as an internal heat exchanger within the refrigeration consumer.

However, Sakamoto teaches in fig. 9, a supercooler (heat exchanger 49) that serves to supercool the refrigerant that flows from the condenser (pg. 8 paragraph 42).

The use of a supercooler heat exchanger will allow the temperature of the refrigerant being discharged to the evaporator to be lower, allowing the refrigeration consumer to handle a high cooling load.

It would have been obvious to a person of ordinary skill in the art at the time of invention to modify the combined teachings of Ueno, McCarty and Monfarad with the teachings of Sakamoto to include a supercooler in order to obtain a very low temperature refrigerant for the purposes of supplying the evaporator of the system with this low temperature refrigerant, which allows the evaporator to be used in a cooling space with a high cooling demand. Ueno as modified by Sakamoto fails to explicitly teach more than one supercooler. However, it would have been obvious to a person of ordinary skill in the art at the time of invention to include supercoolers in the at least one refrigeration consumer, since it has been held that mere duplication of essential working parts of a device involve only routine skill in the art. The use of more than one supercooler will allow the refrigerant to obtain a very low temperature, resulting in more efficient cooling in a cooling space, as the refrigeration system will not have to operate as long to meet a cooling demand.

Response to Arguments

Applicant's arguments filed 10/8/10 have been fully considered but they are not persuasive.

In response to the applicant's argument regarding the 112 rejection on the recitation "realization of a fluid connection" and this being clear to one of ordinary skill in

the art, the examiner disagrees. The realization of a fluid connection can have many different definitions including being in fluid communication with a refrigerant line. The applicant points out that the modified expansion valve must be capable of making a fluid connection, however, this definition is not recited in the specification. The 112 rejection will still remain, since the applicant cannot bring the definition of "capable of making a fluid connection" into this recitation, since this definition was not in the application as filed. Similarly, with respect to the applicant's argument regarding the 112 rejection on the recitation "without a significant pressure drop" being improper, the examiner disagrees. One of ordinary skill would not understand how significant this pressure drop is, since the applicant has not given any reference or numerical values to this significant pressure drop and therefore the 112 rejection remains.

In response to the applicant's piecemeal analysis of the references, it has been held that one cannot show non-obviousness by attacking references individually where, as here the rejection is based on combinations of references.

In response to the applicant's argument regarding McCarty not disclosing a modified expansion valve, the examiner disagrees. Since the interpretation of a modified expansion valve is in fluid communication with a refrigerant line, McCarty meets this definition. Furthermore, as recited above in the rejection of claim 14, the valve moves into a working position during defrosting to allow flow to pass through without a significant pressure drop, since McCarty discloses that a pressure differential bleeds down in the system through the modified expansion valve, and since the compressor is not in this mode of operation, a significant pressure drop does not exist

between the inlet and the outlet of the modified expansion valve as flow is passing through the valve. Lastly in response to the applicant's argument regarding the McCarty reference teaching away the examiner disagrees. As explained above, the modified expansion valve does in fact move into a working position during defrosting to allow flow to pass through the valve without a significant pressure drop therefore McCarty is not teaching away.

In response to the applicant's argument regarding there being no disclosure in Ueno or McCarty stating during the defrosting phase of at least one of the refrigeration consumers moving at least one of the modified expansion valves and at least one of the modified linear compressors of the refrigeration consumers which are to be defrosted into a working position in which through flow occurs without a significant pressure drop, the examiner disagrees. As stated in the rejection above, during a defrosting phase of a refrigeration consumer 12, the refrigeration consumer moving at least one of a modified expansion valve 27 and at least one of a modified linear compressor 36 of the refrigeration consumer 12 which are to be defrosted into a working position in which through flow without a significant pressure change is possible (column 6 lines 59-61). The expansion member 27 is considered to be a modified expansion valve because it is in fluid communication with the refrigerant system. It moves into a working position during defrost (where refrigerant is bypassed around the expansion valve via valve 37 and at the same time a pressure differential bleeds through the valve 27 which indicates a flow of refrigerant) which allows the pressure of the refrigerant in the system not to have a significant pressure drop because some of the refrigerant is being bypassed

around the modified expansion valve. This reduces the overall refrigerant pressure drop of the system. The compressor is considered a modified compressor because it is in fluid communication with the refrigeration system. The modified linear compressor moves into a working position (compressor turning off) in which a through flow (through the system) without a significant pressure change is possible. When the compressor is not in operation, there is no significant pressure change within the system as the compressor is not providing a high pressure refrigerant to the system.

The remainder of Applicant's arguments with respect to claim 14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JONATHAN KOAGEL whose telephone number is (571)270-7396. The examiner can normally be reached on Monday through Friday 7:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571)272-4834 or Frantz Jules (571)272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. K./
Examiner, Art Unit 3744
16 December 2010

/WILLIAM E. TAPOLCAI/
Primary Examiner, Art Unit 3744

